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ABSTRACT

Undergraduates enrolled in a Personalized System of Instruction (PSI) (Keller Plan) section of Principles of Educational Psychology at Mississippi State University were subjects in a study of the effects of no review (NR), review questions (RQ), and review concepts (RC), on short-term retention in a PSI class. The NR group received no review. The RQ group received review questions from the previous unit on their unit mastery tests. The RC group received review concepts from the previous unit. The test of retention was a multiple choice exam constructed by the investigators. A completely randomized blocking design was employed to analyze the data. The blocking variable was grade point average. The data were analyzed for the complete test of retention and for a subset of review-related questions. No significant differences were found among the NR group, the RQ group, and the RC group on a test of retention, a finding supported by previous research. No signficant differences were found between the higher grade point average group and the low grade point average group. References and an appendix with several sample review questions are provided. (Author/LC)

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THE EFFECTS OF REVIEW QUESTIONS AND REVIEW CONCEPTS ON RETENTION IN A PERSONALIZED SYSTEM OF INSTRUCTION CLASS

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Description of PSI

The particular version of Keller's Personalized System of Instruction approach used by the Department of Educational Psychology at Mississippi State University includes the following:

1. Stress is placed on the written word in the form of a textbook and study guide.
2. The course content is divided into 12 units and the student is given three chances to master each unit at a 90% mastery level.
3. The course is basically self-paced with the requirement that students must complete Units 1 - 5 by the mid-term examination.
4. Peer tutors/proctors are used to score the unit quizzes and tutor the students on any material with which they have difficulty.
5. There are no lectures of any sort.
6. Grades are assigned on the following basis:

   A = 90% mastery on 10 out of 12 units and an average of 75% on the midterm and final exam.

   B = 90% mastery on 8 out of 12 units and an average of 65% on the midterm and final exam.

   C = 90% mastery on 6 out of 12 units and an average of 55% on the midterm and final exam.

   No D's are given in the course.

   Incompletes are given if the student shows sustained but slow progress throughout the semester.

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Problem

Research indicates that students taught either by Keller's Personalized System of Instruction (PSI) or traditional lecture approaches do rather poorly on tests of retention; however, PSI students earn higher scores (Cooper & Greiner, 1971 and Corey & McMichael, 1974). The need for more effective ways of improving retention in PSI classes has been established by Davis (1975) and Williams (1976). The problem investigated was the effects of no review (NR), review questions (RQ), and review concepts (RC) for students with high and low grade point averages on short term retention (the midterm exam) in a PSI class.

Method

Undergraduates in a PSI section of educational psychology in the spring of 1979 served as subjects. A total of 114 students agreed to participate. The students were randomly assigned to one of 13 proctors/tutors. Subjects were divided at the median (2.67) into two GPA groups and randomly assigned to the three treatment groups.

The RQ group received four review questions from the previous unit in addition to the standard 20 questions on the first form of the unit mastery tests for units 2 - 5. Each review question required application of a concept. The RQ group were required to answer the review questions and received immediate feedback from their proctors; their responses did not affect their scores on the tests.

The RC group were presented with a typewritten explanation of the concepts tested by the review questions. The four concepts were presented by their proctors upon completion of each unit test. After the student read the explanation, the sheet was collected by the proctor. The NR group obviously received no review of any kind.

The retention test--50 multiple-choice items covering units 1 - 5 had an alpha coefficient of .85. The items required recall of facts and application of concepts. The retention test was administered to the remaining 78 students in the middle of the semester. (See Appendix A for examples of questions and review concepts.)

Results

A completely randomized blocking design was used to analyze the data. The mean GPA for the HGPA was 3.15; the mean GPA for the LGPA group was 2.14.

The null hypothesis of no significant differences between students with a HGPA and those with a LGPA on the retention test was not rejected, $F(1,75) = 1.67$, $p > .05$. The means being 37.26 and 38.99, respectively. The null hypothesis of no significant differences among the three treatment groups on the retention test was also not rejected, $F(2,75) = .08$, $p > .05$. The means being 38.05 for the NR group, 38.02 for the RQ group, and 38.06 for the RC group.

In addition to performing an analysis on the data for the entire 50 item test, an analysis was performed on the first 16 questions from the retention test. Since the 16 questions were directly related to the review questions and review concepts, it was felt that the students in the RQ and RC groups may have performed better on these questions than the students in the NR group. However, the results were again nonsignificant, with the means of the HGPA and LGPA groups being 12.10 and 12.80, respectively and the means for the NR, RQ, and RC groups being 12.59, 12.18, and 12.86, respectively.

Interpretation

Finding no significant differences among the treatment groups lends support to studies by Davis (1975), in which he found students who were not re-

quired to answer review questions to pass unit mastery tests performed less well on the final exam than students who were required to answer the questions in order to master the unit tests.

Other possible reasons for finding no significant differences among the treatment groups are: (a) Course grade contingency may have had such a dominant influence on student performance that it overshadowed any differences in performance due to the review procedures (Johnston & O'Neill, 1978). That is, since grades were partly determined by performance on the test used as the dependent variable, students tried to perform at the specified level and this was more influential on student performance than were the review procedures. Forty-nine of the seventy-eight students met the minimum criterion for an A on the midterm exam; (b) The RQ and RC groups may have not received enough review to be beneficial. They received review on only four concepts for each unit. It may be that if more review is provided, it would have a greater effect on performance on the retention test; and (c) Some of the RC group may not have read the concepts or did not spend enough time reading them. They were given to the students to read; however, it is possible that they paid little attention to what they were reading.

References

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Davis, M. L. Some effects of an integrated review procedure. In J. Johnston & G. W. O'Neill (Eds.), Research and technology in college and university teaching. Atlanta, Ga.: Georgia State University Urban Life Center, 1975.

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APPENDIX A

Example of a review question:

Annie misbehaves in class. Her teacher paddles her whenever she misbehaves. Annie stops misbehaving in class. The paddling serves as a _____ for Annie's misbehavior.

1. punisher (Type I)
2. punisher (Type II)
3. negative reinforcer
4. positive reinforcer

Example of a review concept:

Punishment Type I - the presentation of a noxious stimulus usually in an attempt to eliminate some undesirable behavior.

Example of related item on the retention test:

The presentation of an unpleasant stimulus in an attempt to eliminate some undesirable behavior is referred to as

1. punishment I.
2. punishment II.
3. negative reinforcement.
4. extinction.